

Activity Diagrams

Based on Chapter 5 of Bennett, McRobb and Farmer:

Object Oriented Systems Analysis and Design Using UML, (3rd Edition), McGraw Hill, 2005.

In This Lecture You Will Learn:

- The purpose of activity diagrams
- The notation of activity diagrams
- How to draw activity diagrams

Drawing Activity Diagrams

■ Purpose

- to model a task (for example in business modelling)
- to describe a function of a system represented by a use case
- to describe the logic of an operation
- to model the activities that make up the life cycle in the Unified Process

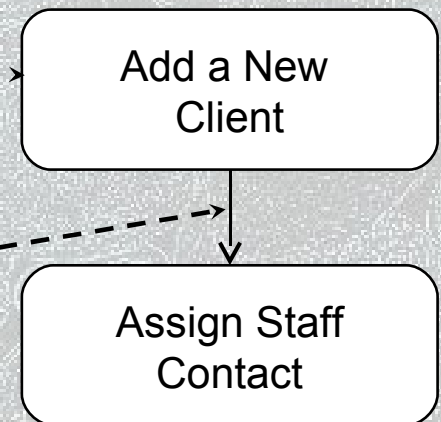
Notation of Activity Diagrams

■ Actions

- rectangle with rounded corners
- meaningful name

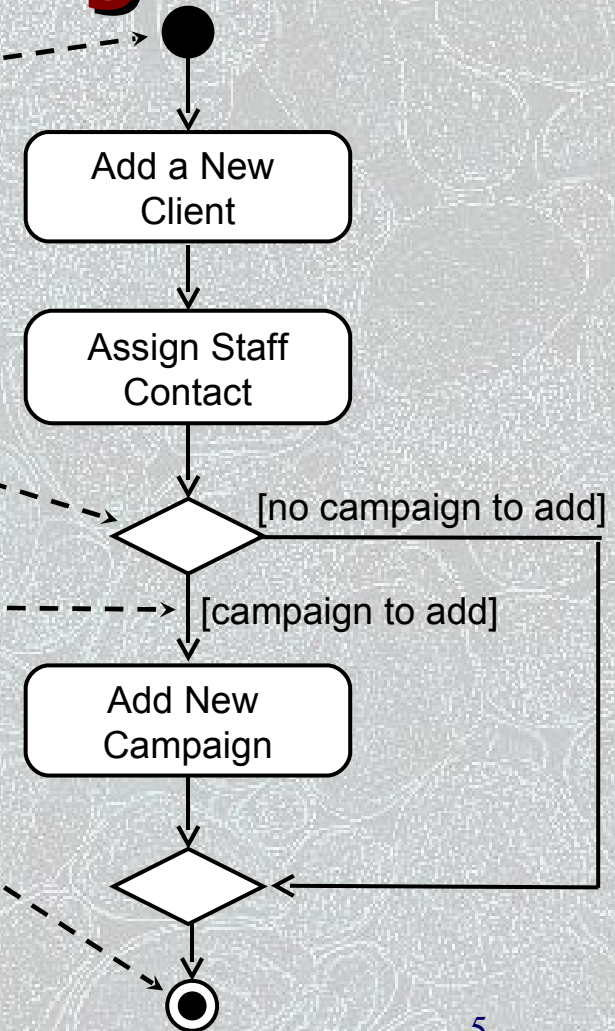
■ Control flows

- arrows with open arrowheads



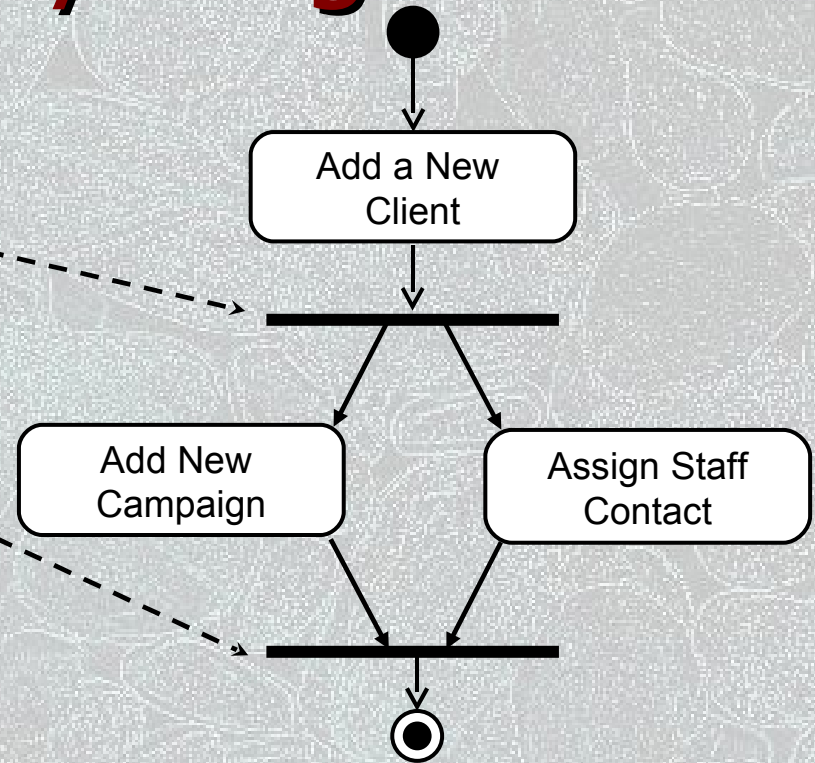
Notation of Activity Diagrams

- Initial node
 - black circle
- Decision nodes (and merge nodes)
 - diamond
- Guard conditions
 - in square brackets
- Final node
 - black circle in white circle



Notation of Activity Diagrams

- Fork nodes and join nodes
 - thick bar
- Actions carried out in parallel



Notation of Activity Diagrams

- In UML 1.X multiple flows from an action were implicitly ORed
- In UML 2.0 they are implicitly ANDed
- Guard conditions do not have to be mutually exclusive, but it is advisable that they should be
- Decisions should be strictly nested, but...
- ... a merge point can be combined with a following decision point

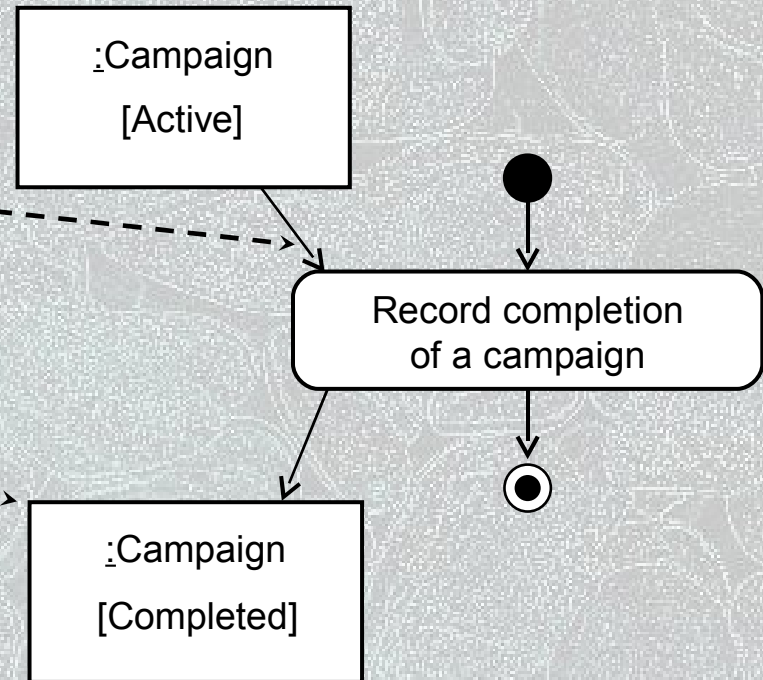
Notation of Activity Diagrams

- Object flows

- open arrow

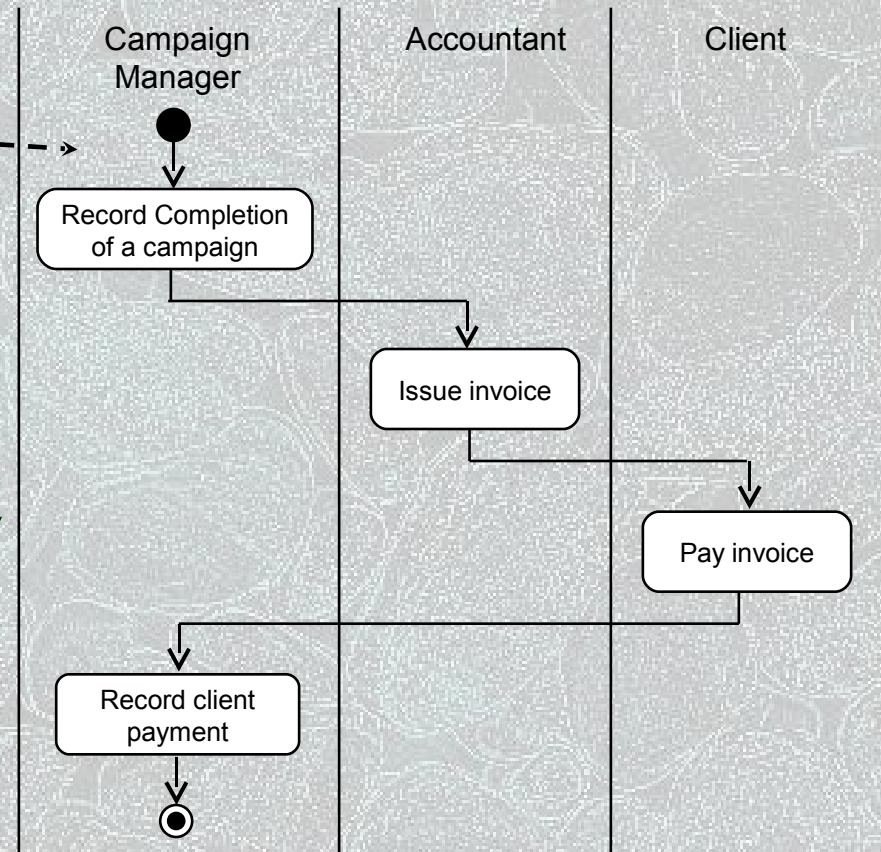
- Objects

- rectangle
- optionally shows the state of the object in square brackets



Notation of Activity Diagrams

- Activity Partitions (Swimlanes)
 - vertical columns
 - labelled with the person, organisation, department or system responsible for the activities in that column



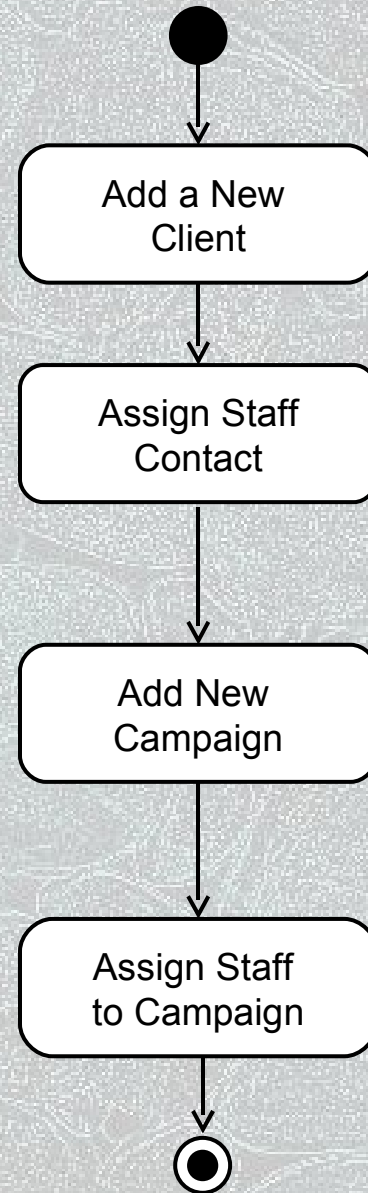
Drawing Activity Diagrams

- What is the purpose?
 - This will influence the kind of activities that are shown
- What is being shown in the diagram?
 - What is the name of the business process, use case or operation?
- What level of detail is required?
 - Is it high level or more detailed?

Drawing Activity Diagrams

- Identify actions
 - What happens when a new client is added in the Agate system?
 - Add a New Client
 - Assign Staff Contact
 - Add New Campaign
 - Assign Staff to Campaign
- Organise the actions in order with flows

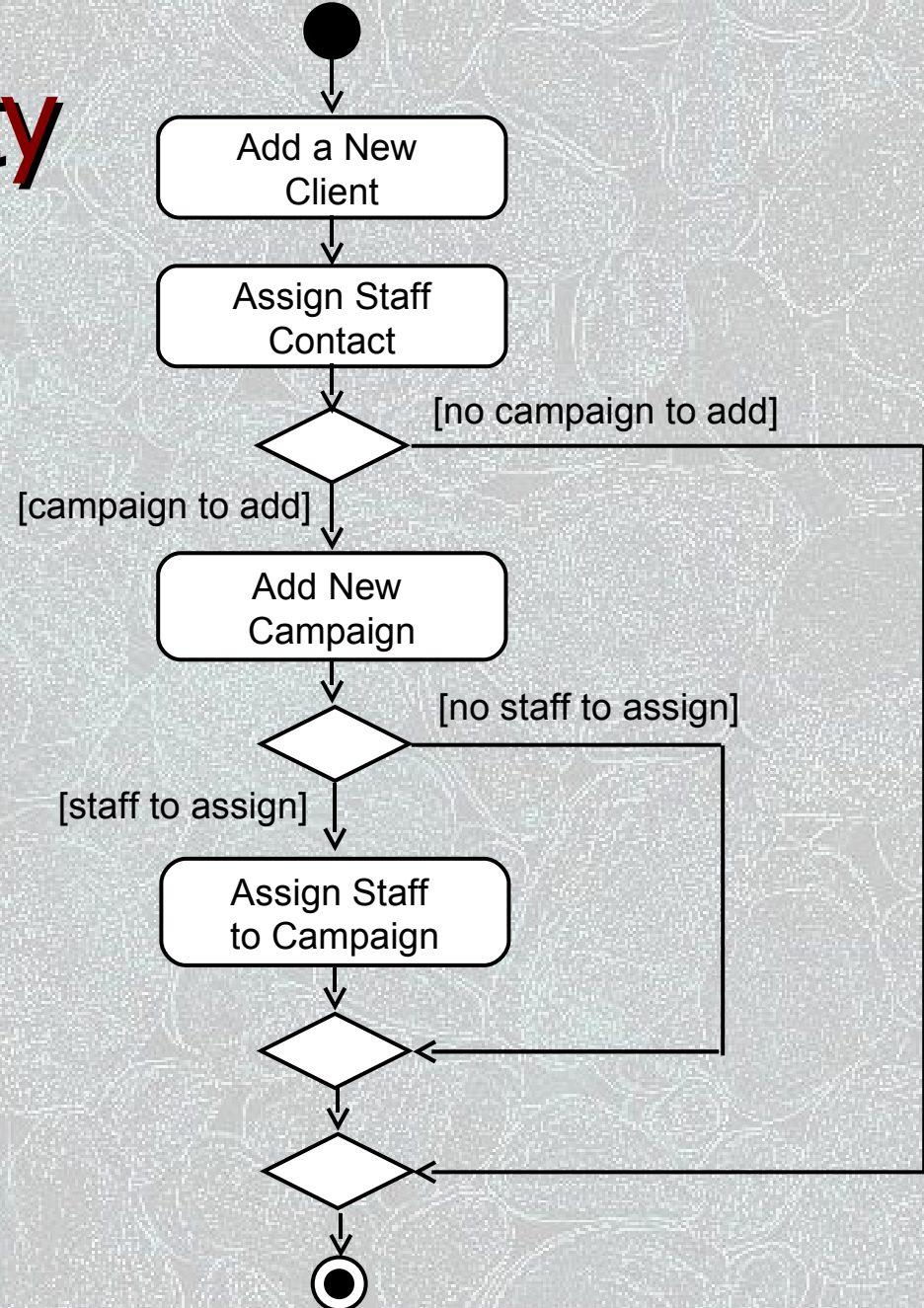
Drawing Activity Diagrams



Drawing Activity Diagrams

- Identify any alternative flows and the conditions on them
 - sometimes there is a new campaign to add for a new client, sometimes not
 - sometimes they will want to assign staff to the campaign, sometimes not
- Add decision and merge nodes, flows and guard conditions to the diagram

Drawing Activity Diagrams



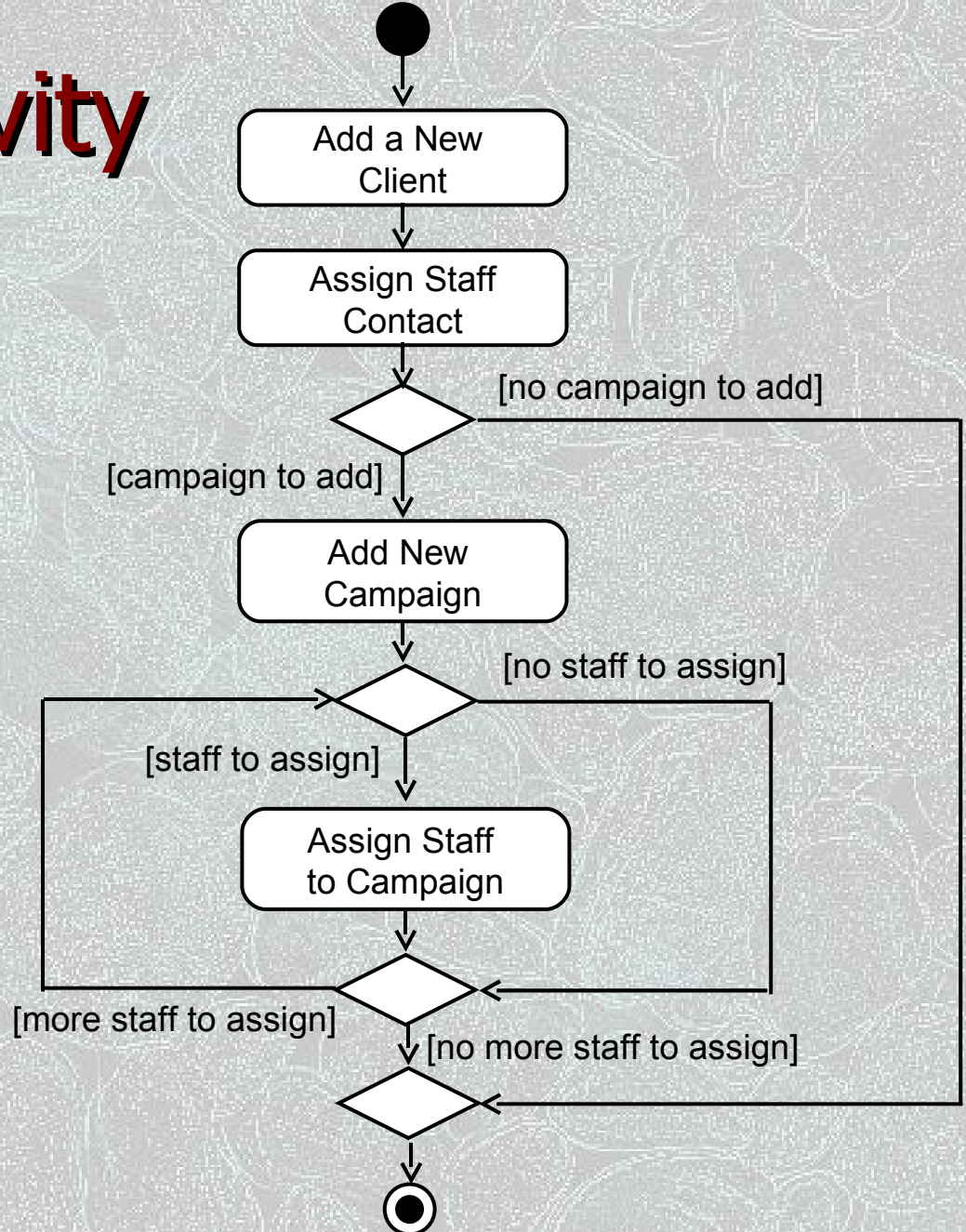
Drawing Activity Diagrams

- Identify any actions that are carried out in parallel
 - there are none in this example
- Add fork and join nodes and flows to the diagram

Drawing Activity Diagrams

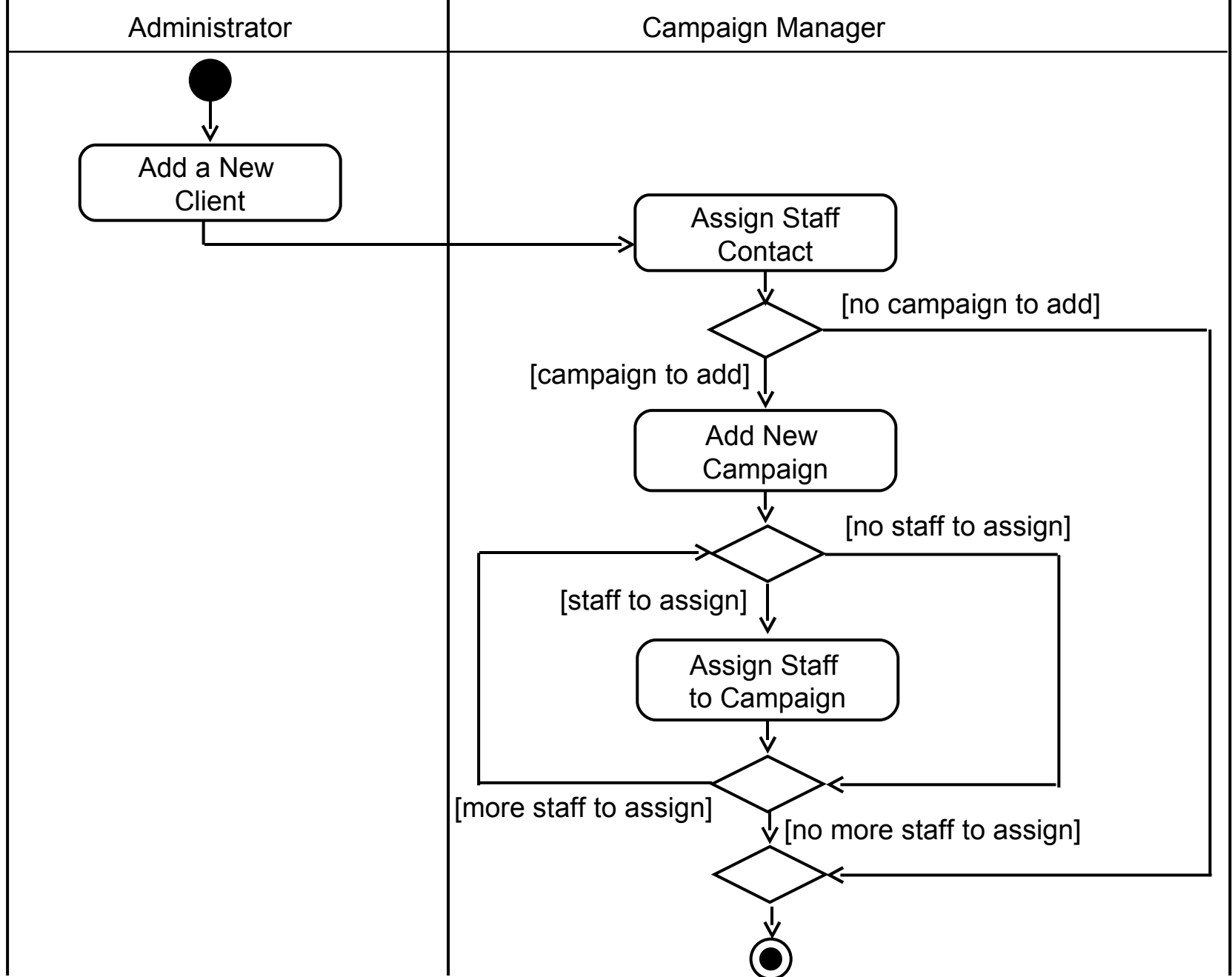
- Identify any processes that are repeated
 - they will want to assign staff to the campaign until there are no more staff to add
- Add decision and merge nodes, flows and guard conditions to the diagram

Drawing Activity Diagrams



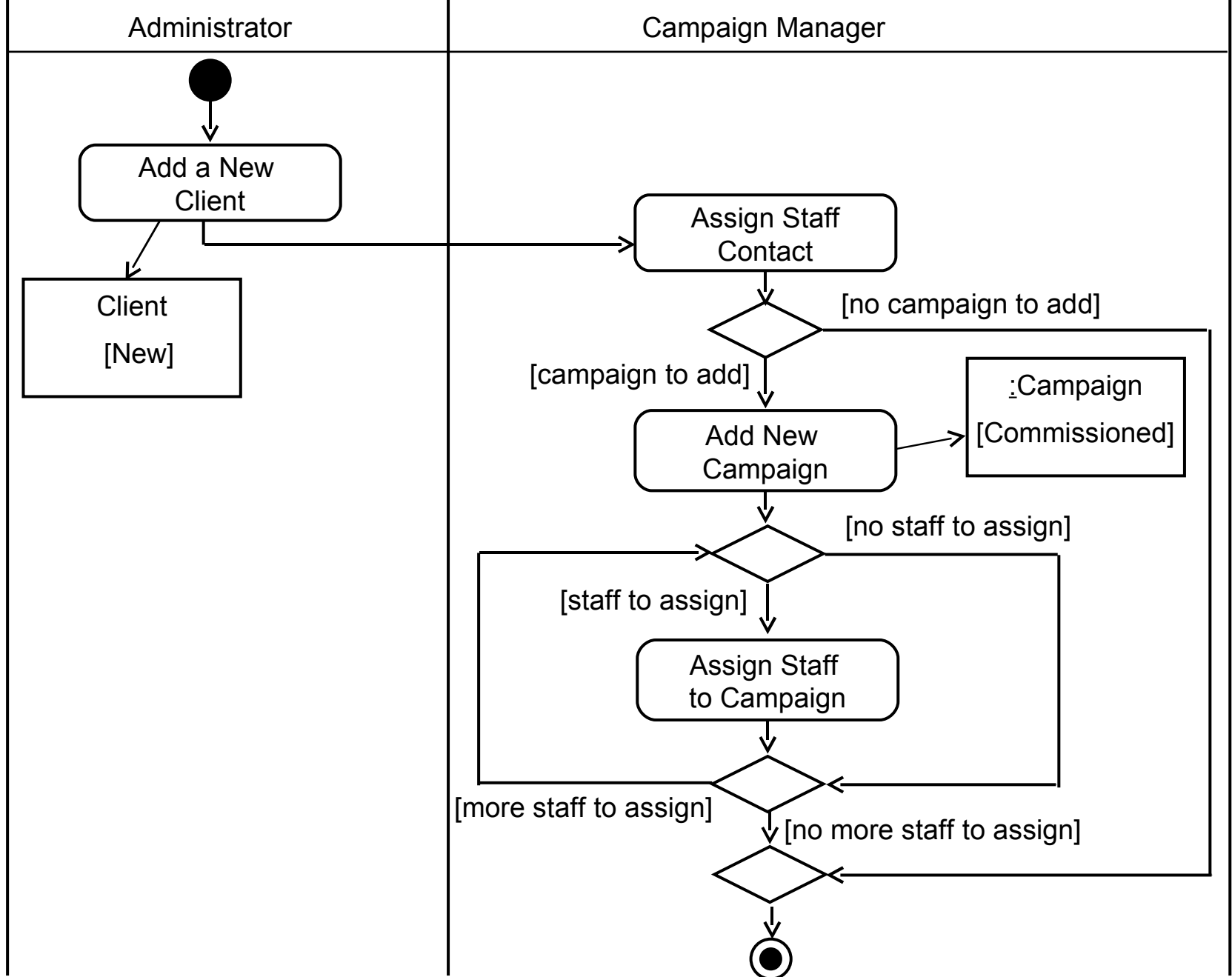
Drawing Activity Diagrams

- Are all the activities carried out by the same person, organisation or department?
- If not, then add swimlanes to show the responsibilities
- Name the swimlanes
- Show each activity in the appropriate swimlane



Drawing Activity Diagrams

- Are there any object flows and objects to show?
 - these can be documents that are created or updated in a business activity diagram
 - these can be object instances that change state in an operation or a use case
- Add the object flows and objects



Summary

In this lecture you have learned about:

- The purpose of activity diagrams
- The notation of activity diagrams
- How to draw activity diagrams

References

- The notation and semantics of activity diagrams have changed significantly since UML was first released. The original UML books are now out of date on the subject.
- Bennett, Skelton and Lunn (2005)
(For full bibliographic details, see Bennett, McRobb and Farmer)